Transforming Conservation Through Technology

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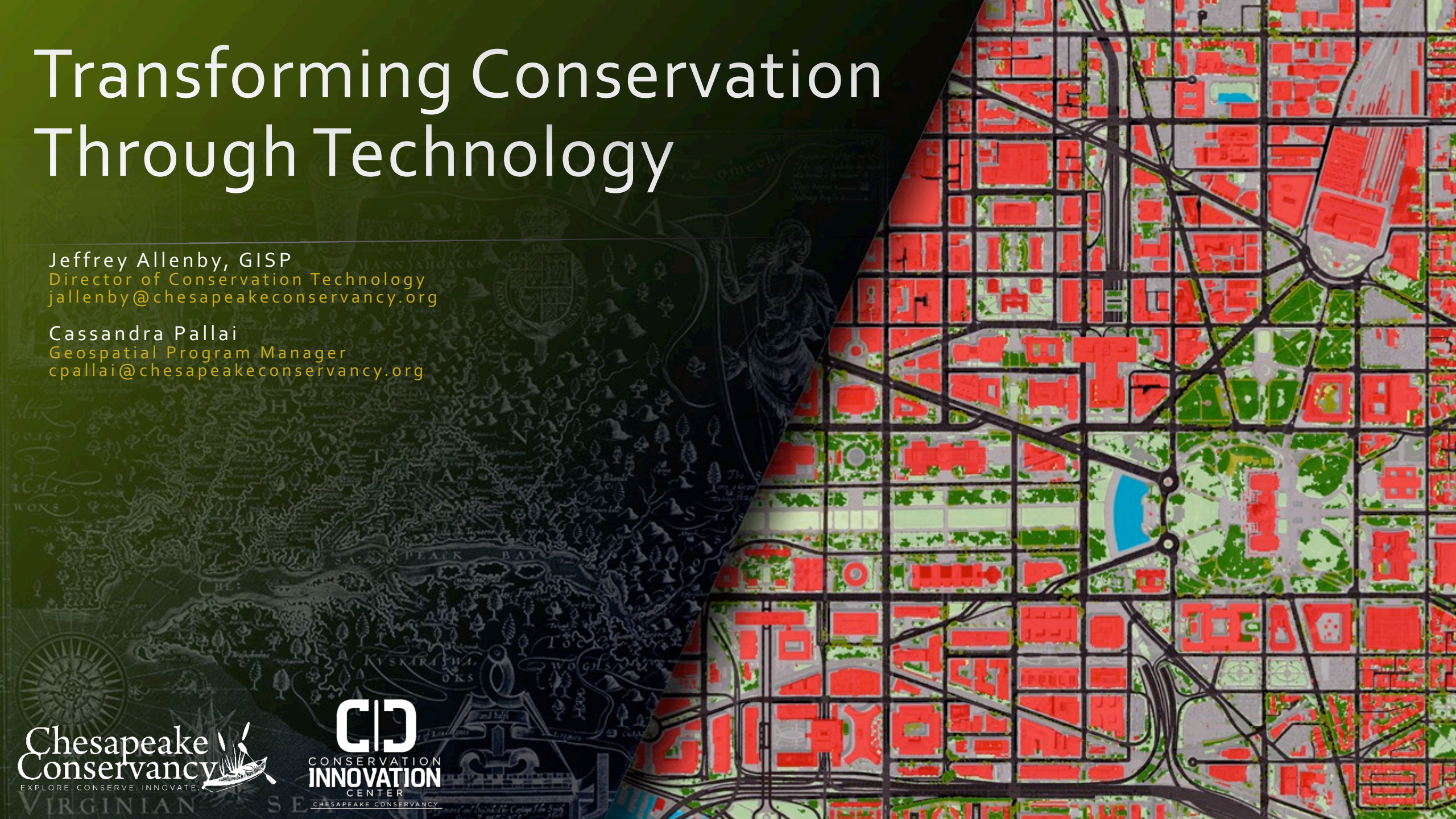

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EXPLORE. CONSERVE. INNOVATE.

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CHESAPEAKE CONSERVANCY

Our Mission

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Current Planning Limitations

- Models use coarse data
  - Produce coarse priorities
- Lack of sensitivity to landscape conditions
- Policies often do not incentivize high-performing projects

Impacts on the Ground

In an Ideal World

Set flexible restoration goals

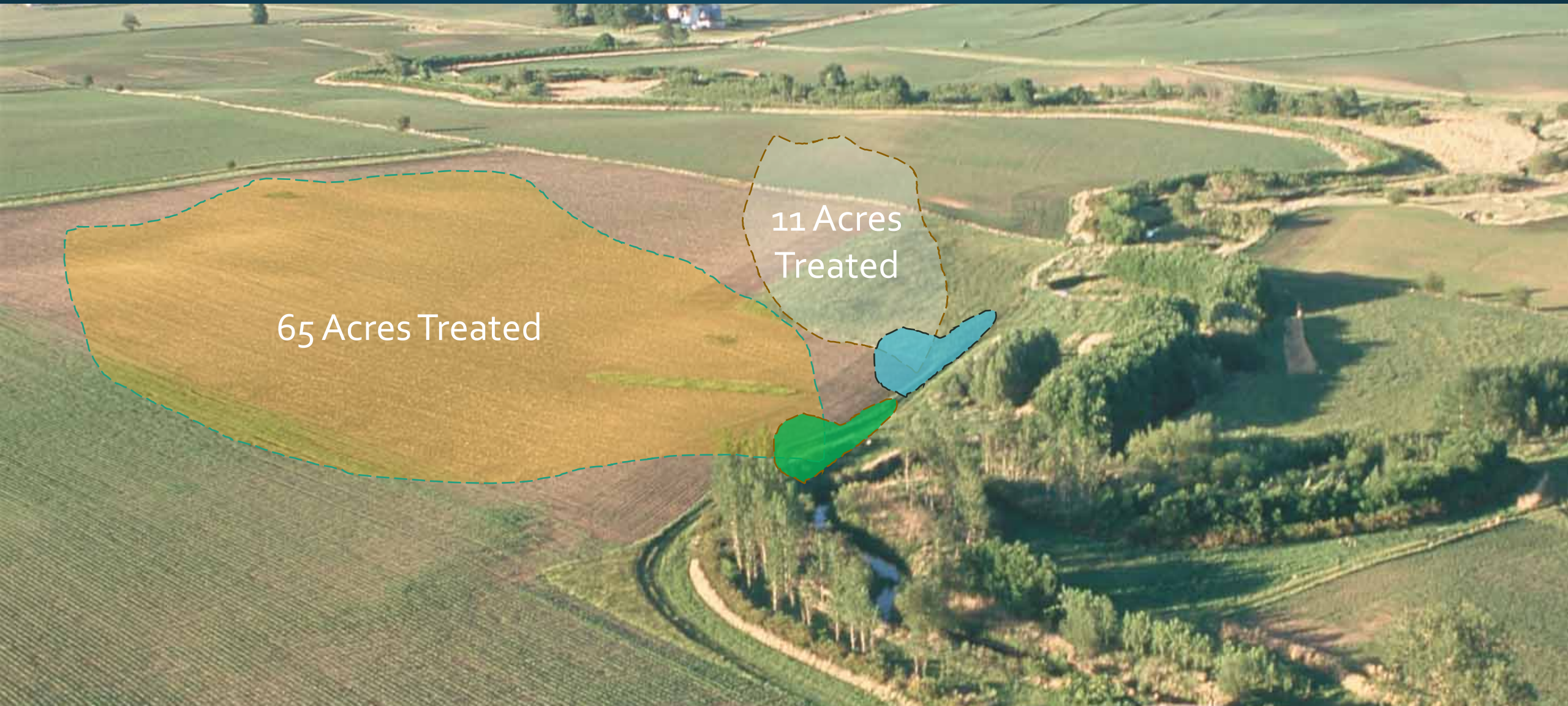
Incentivize high performing actions

Identify specific actions that would maximize the benefits

Progress is measured based on ***performance***

PA Environmental Digest Daily

Measuring Progress



Moving the Needle

Needs:

High-resolution data for analysis, planning, and reporting

Tools for planners and managers of all tech skill levels

Programs that incentivize performance instead of effort

Precision Conservation

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"Getting the right practices,
in the right places,
at the right scale"

Enabling Partners

Data

Land Cover/Use

Flow Path Maps

Prioritization

Web-based tools

Access

Products

Data Motivation and Partners

TMDL and 2025 Pollution Reduction Goals

Chesapeake Conservancy

- Maryland
- Washington D.C.
- New York
- West Virginia

University of Vermont SAL

- Delaware
- Pennsylvania

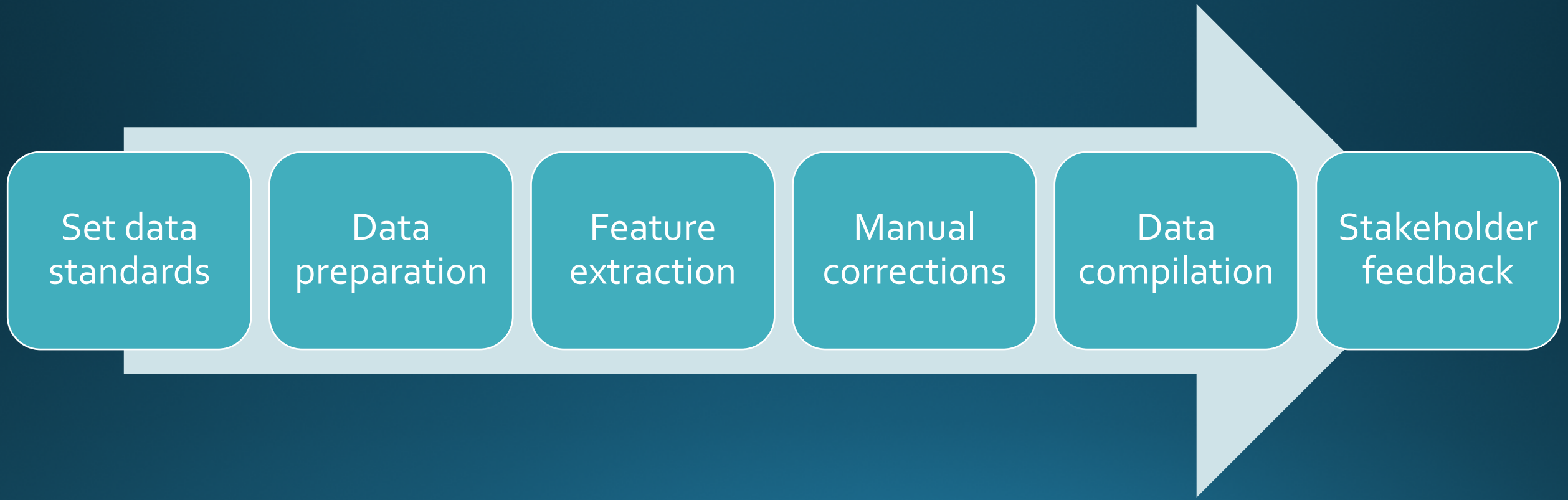
WorldView Solutions

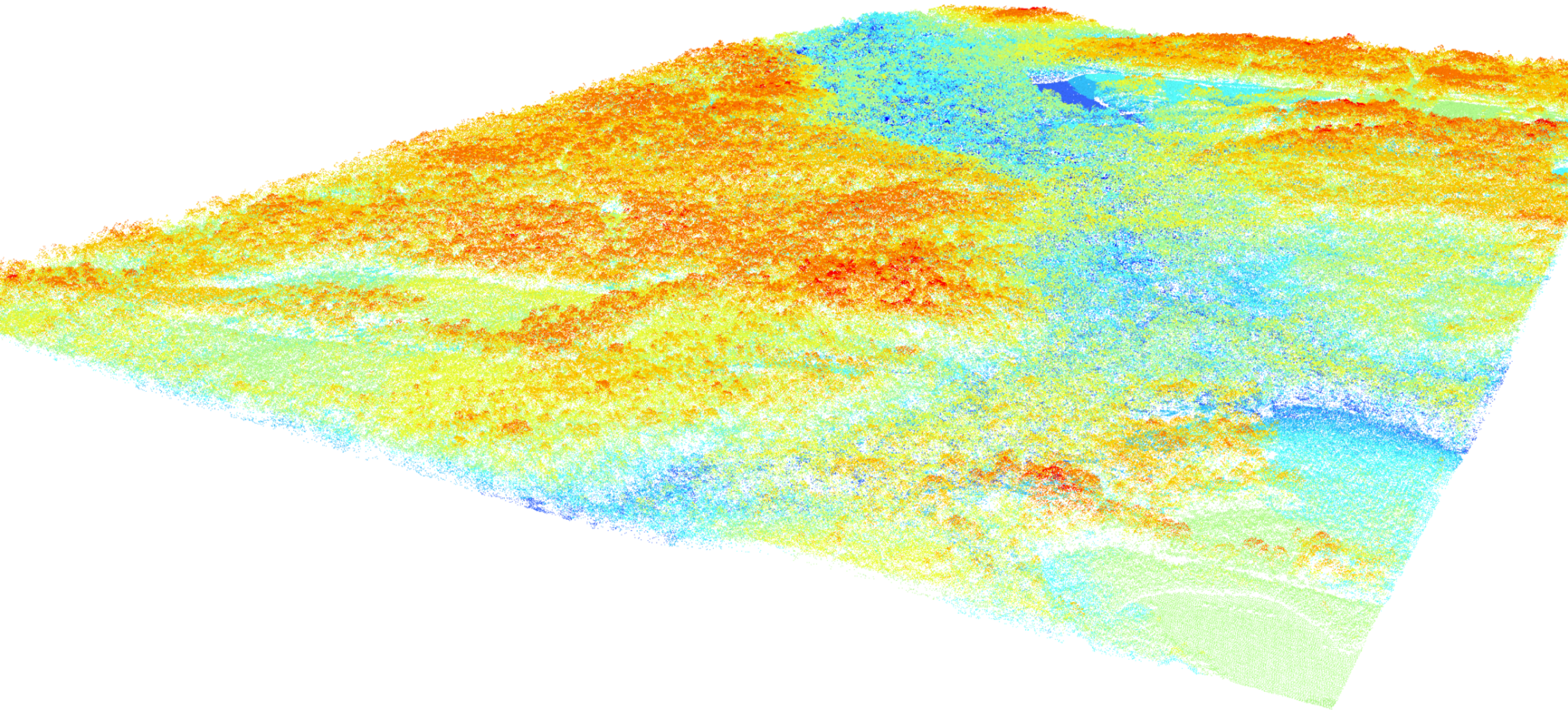
- Virginia

NASA Satellite Imagery

York County Planning Commission

Phases of Classification





Workflow

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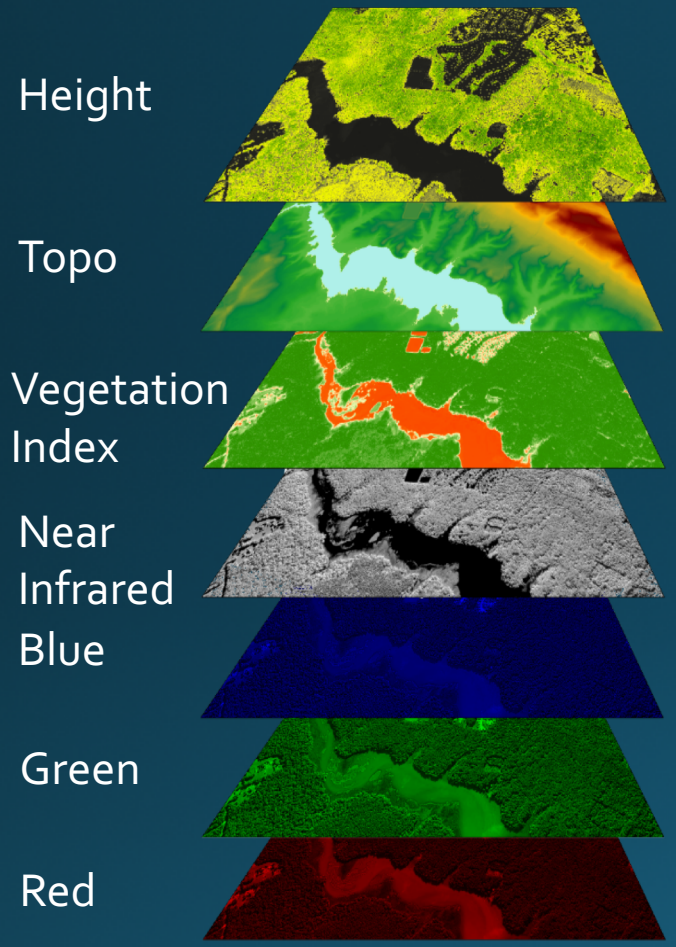
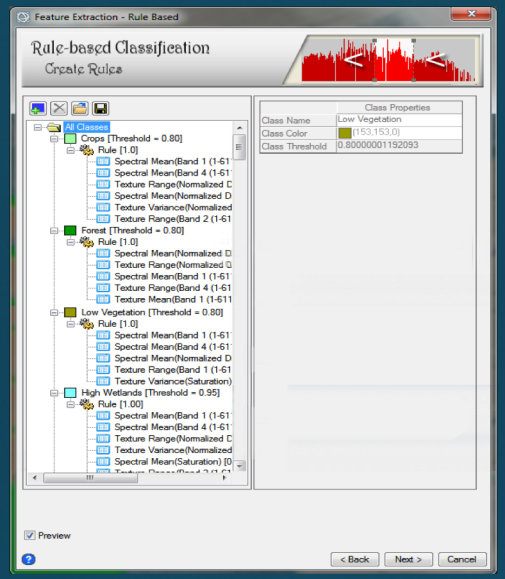
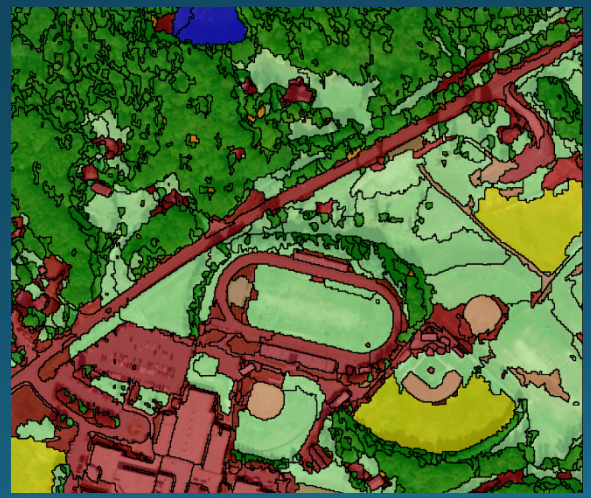
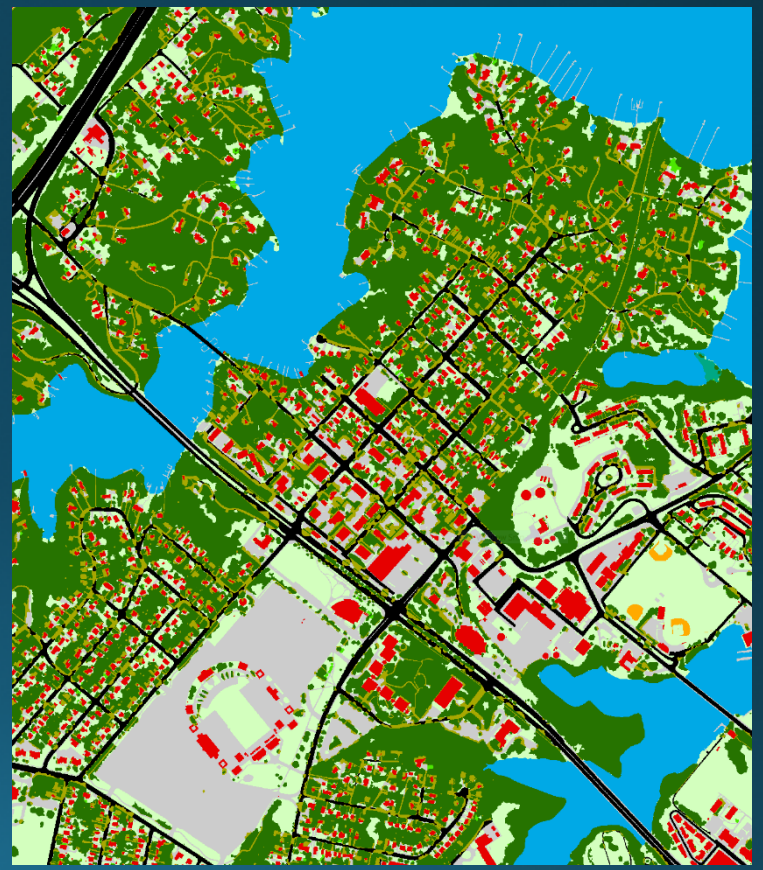


Collect Data for Landscape



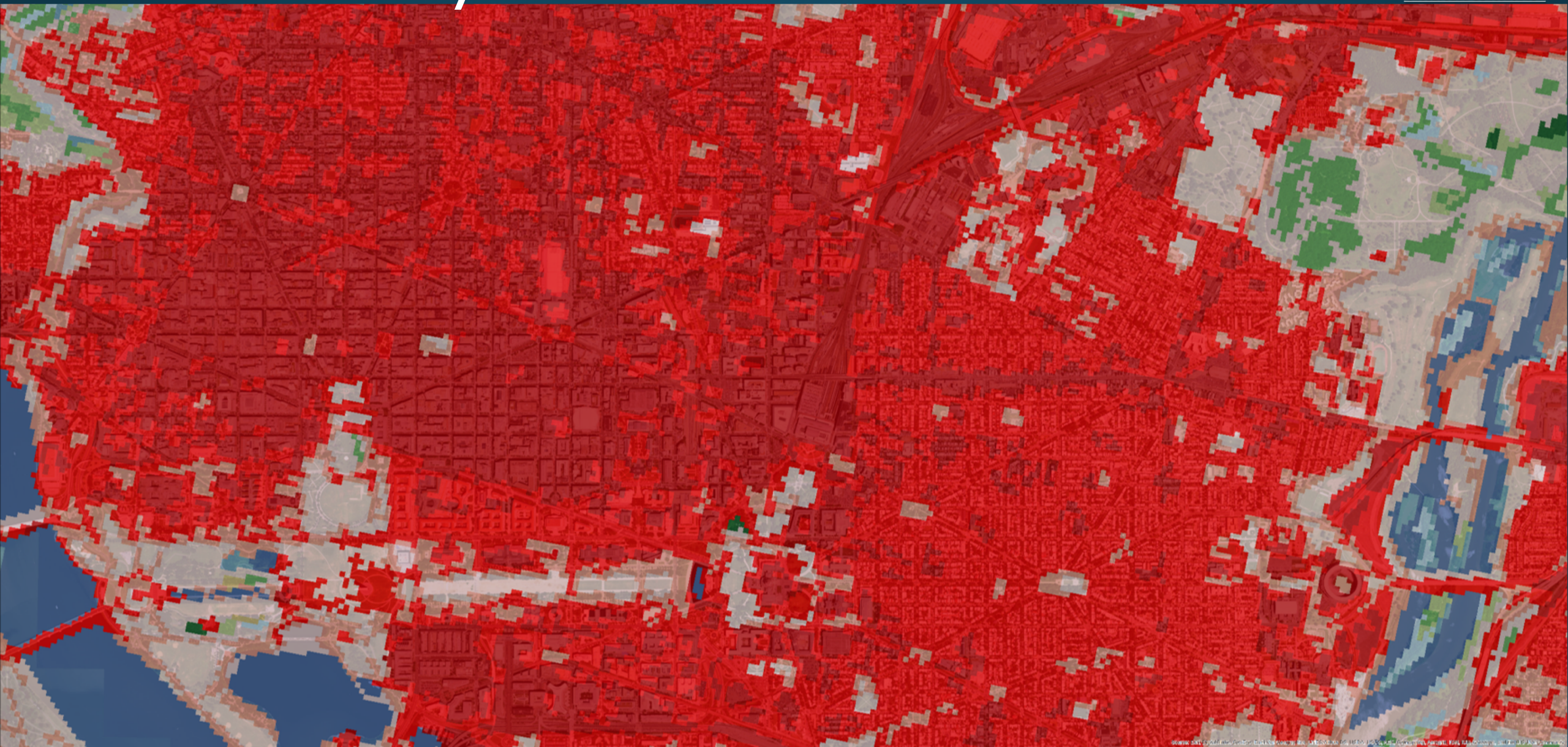


Classify Data for Landscape

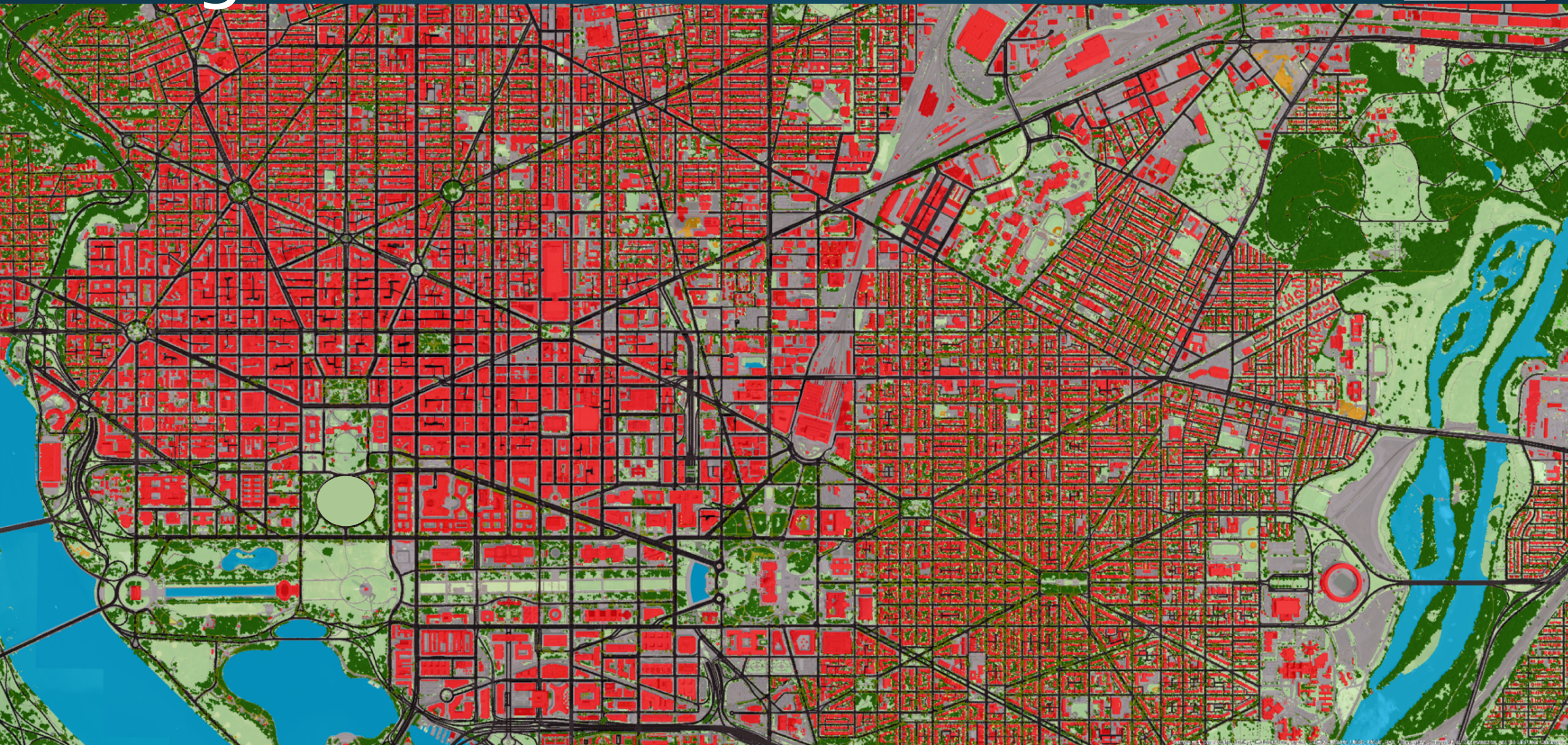


Correct Mistakes

Previously Available Data



High-resolution Data



High-resolution Data

Planning at the Parcel Scale

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Data Specifications

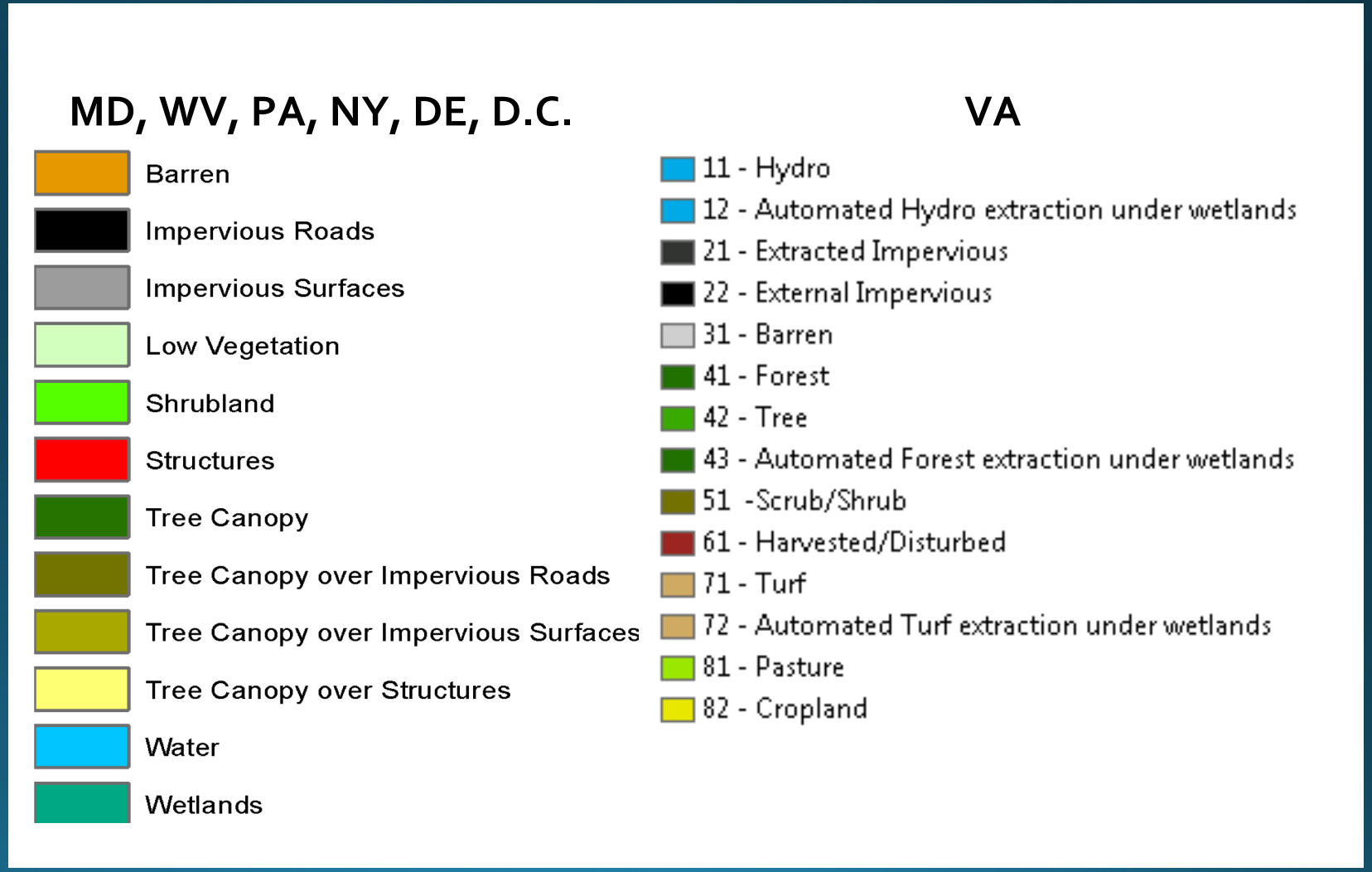
Raster format

2013/2014 conditions

1 meter pixel size

4-bit pixel depth

Projection: Albers Equal Area – USGS version



Lessons Learned

1. Classification methodology
2. Source data
3. Data review and county requirements gathering
4. Accuracy and deliverable expectations

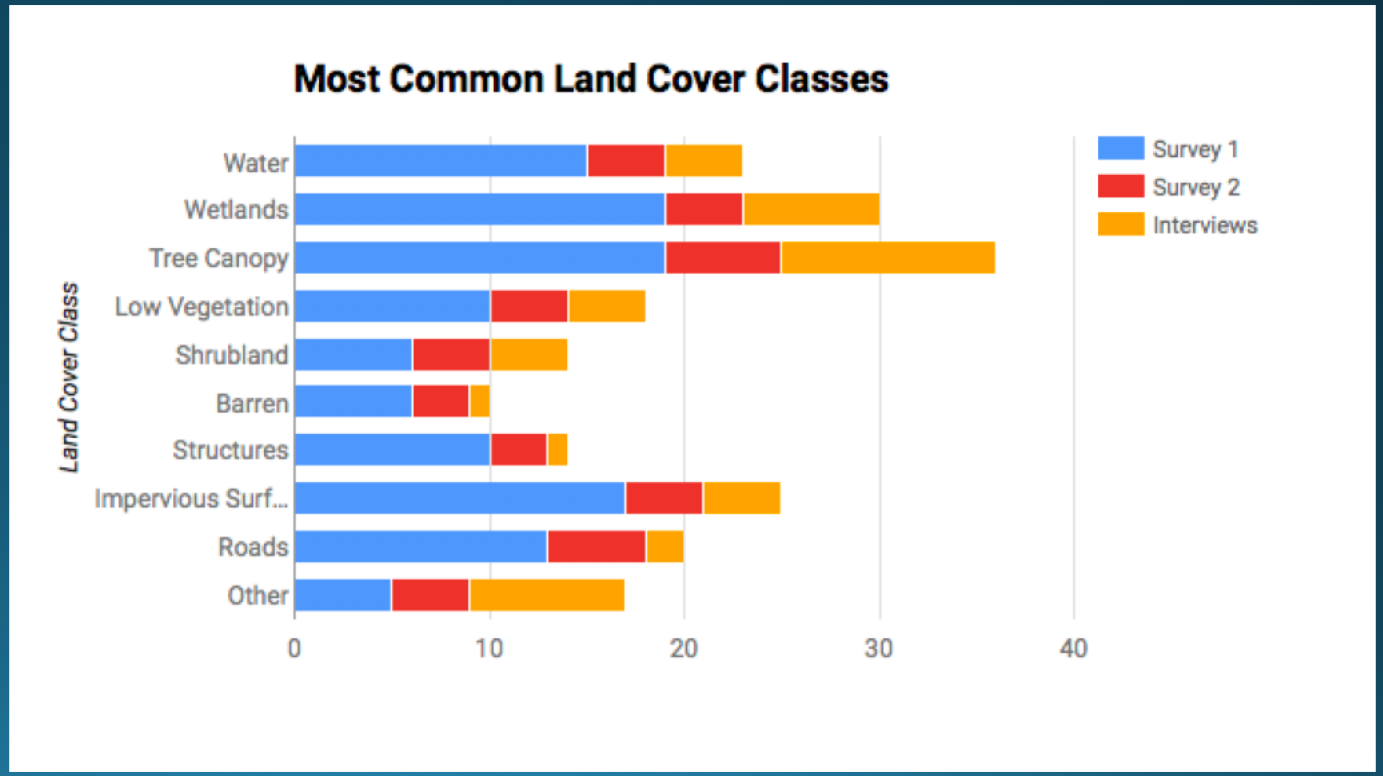
Figure 7. Sections of road not included in planimetric data.

Figure 5. WV NAIP example (left) and at manual corrections scale (right).

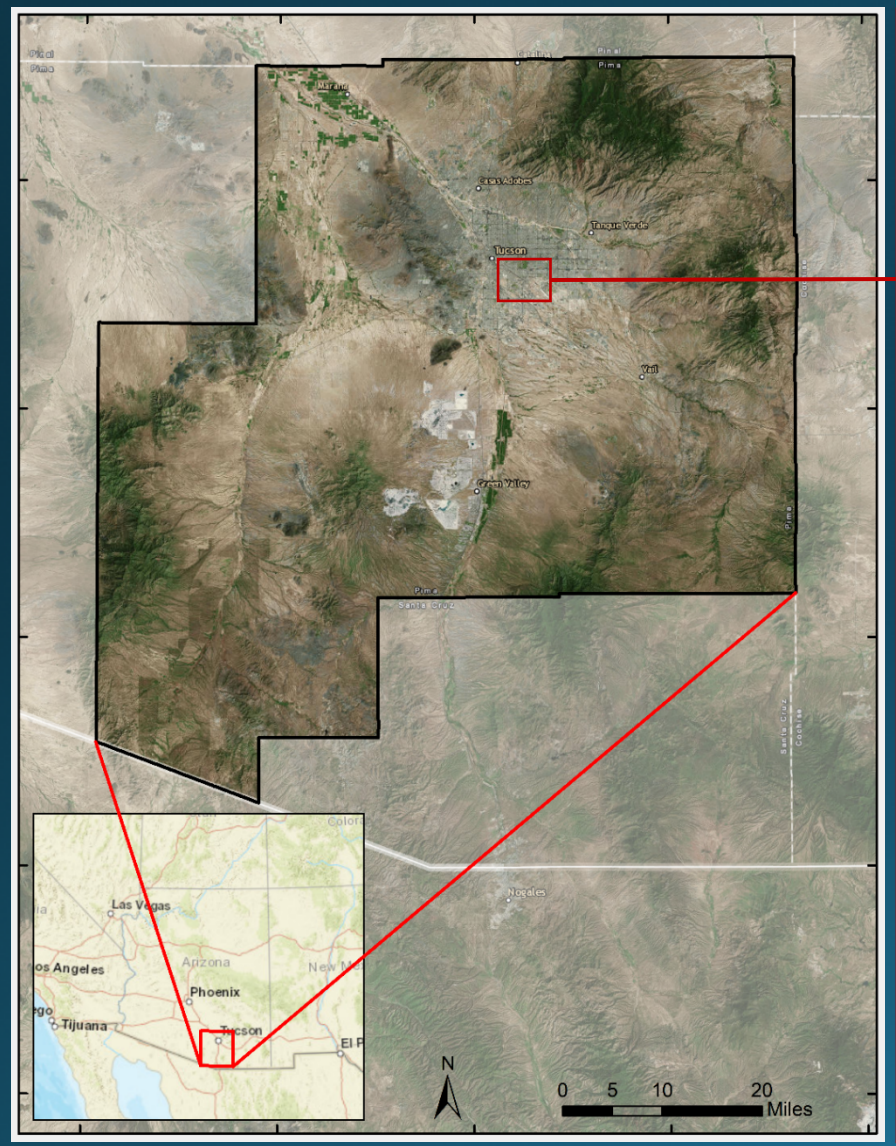
Figure 6. WV leaf-off example (left) and highlighting missing pixels in red (right).

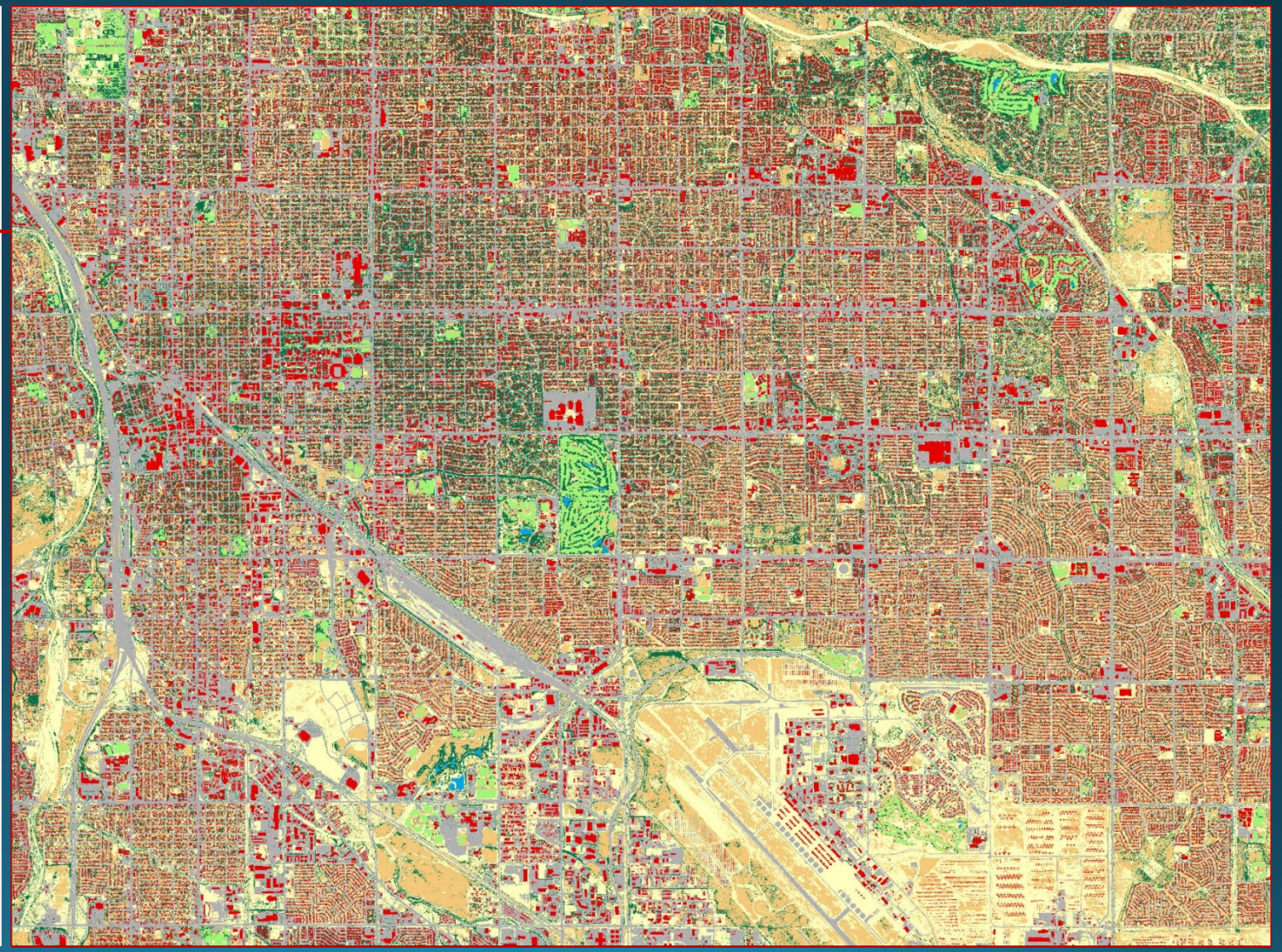
User Feedback

- ✓ Include agricultural land in the land cover dataset
- ✓ Separate wetlands class into subgroups that mimic NLCD's
- ✓ Include an outcrop and mine class or layer
- ✓ Separate tree canopy class into subgroups that mimic NLCD's
- ✓ Create a more robust shrubland class
- ✓ Expand NY and WV to state boundaries for state-wide analysis
- ✓ Convert from raster to vector format
- ✓ Consider a coarser-resolution dataset
- ✓ Calculate land cover class areas and percentages in the attribute tables.

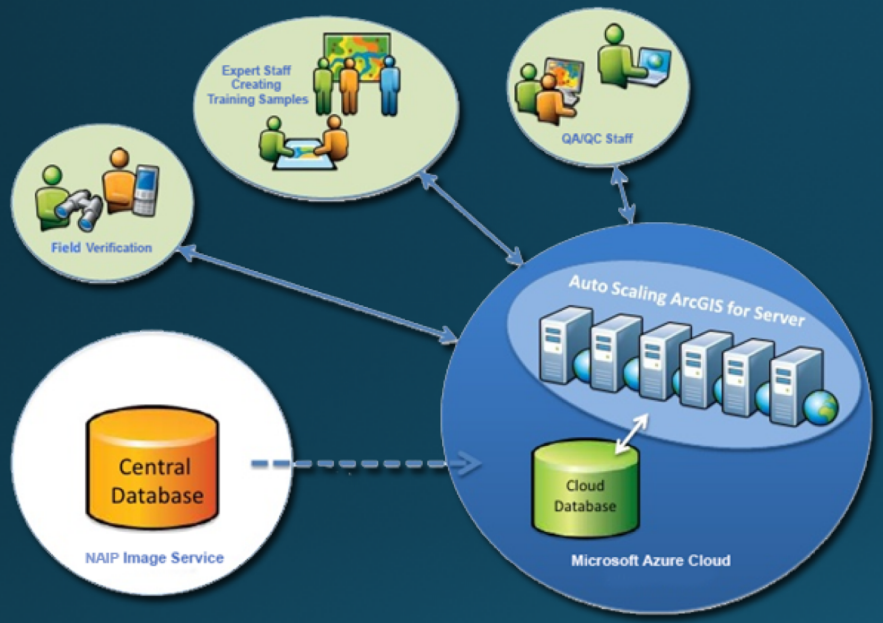


Moving to other landscapes





What's next?



esri

Microsoft Azure

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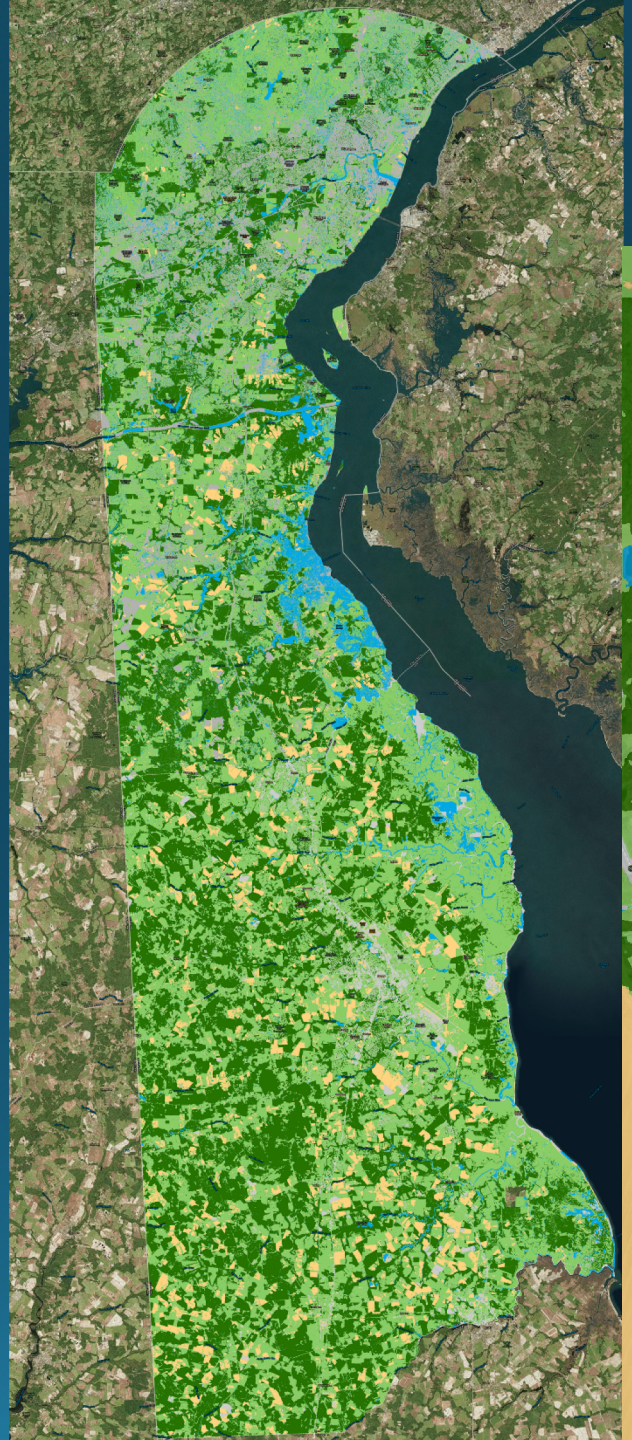

Lidar Flow Path Mapping

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Lidar Flow Path Mapping

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Enabling Partners

Data

Land Cover/Use

Flow Path Maps

Prioritization

Web-based tools

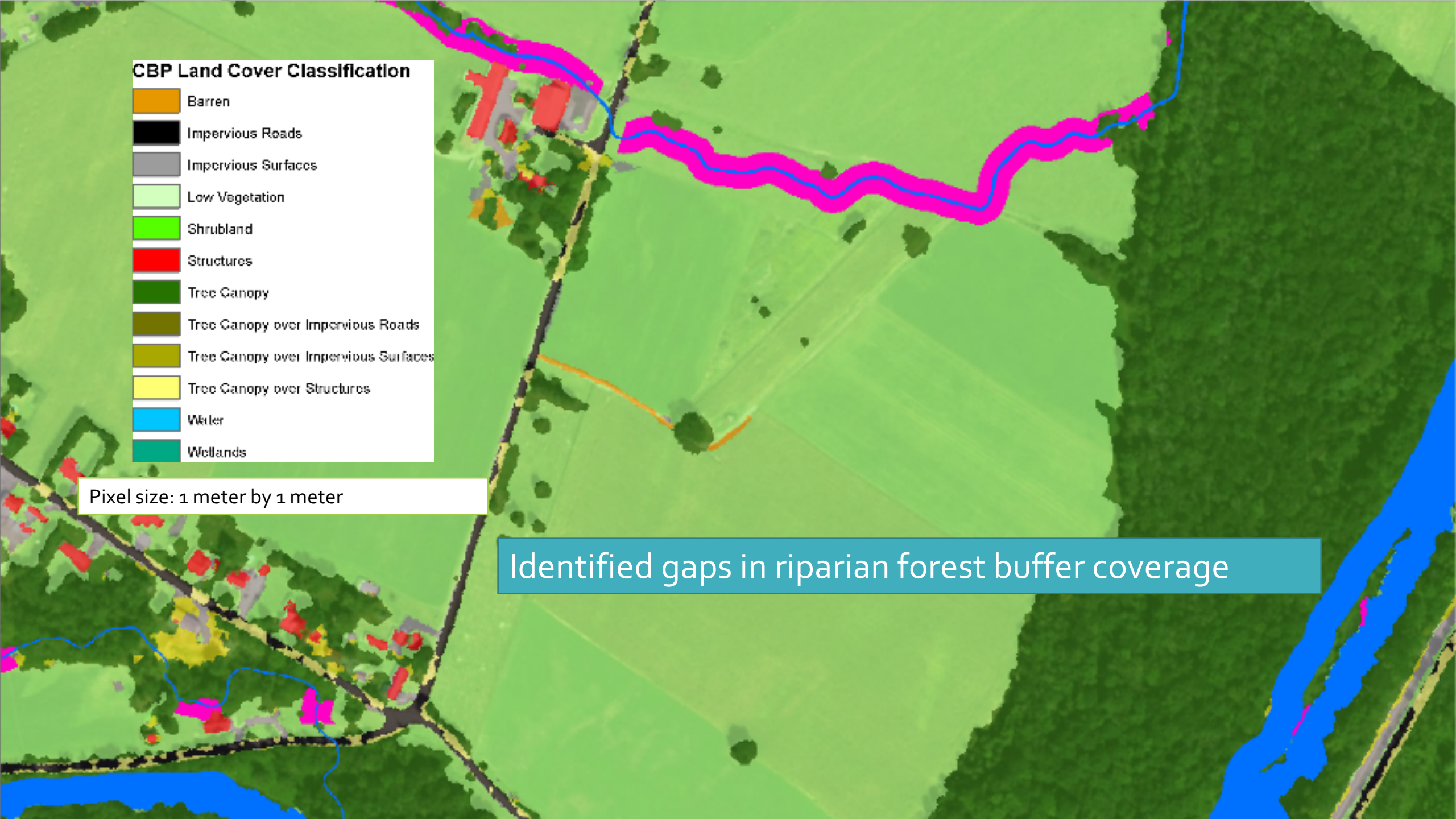
Access

Products

Better data is only useful if it can be harnessed to inform better projects

Goal: Identify priority locations for BMP implementation

CBP Land Cover Classification
Barren
Impervious Roads
Impervious Surfaces
Low Vegetation
Shrubland
Structures
Tree Canopy
Tree Canopy over Impervious Roads
Tree Canopy over Impervious Surfaces
Tree Canopy over Structures
Water
Wetlands
Pixel size: 1 meter by 1 meter
High Resolution Land Cover & Concentrated Flow Paths


CBP Land Cover Classification
Barren
Impervious Roads
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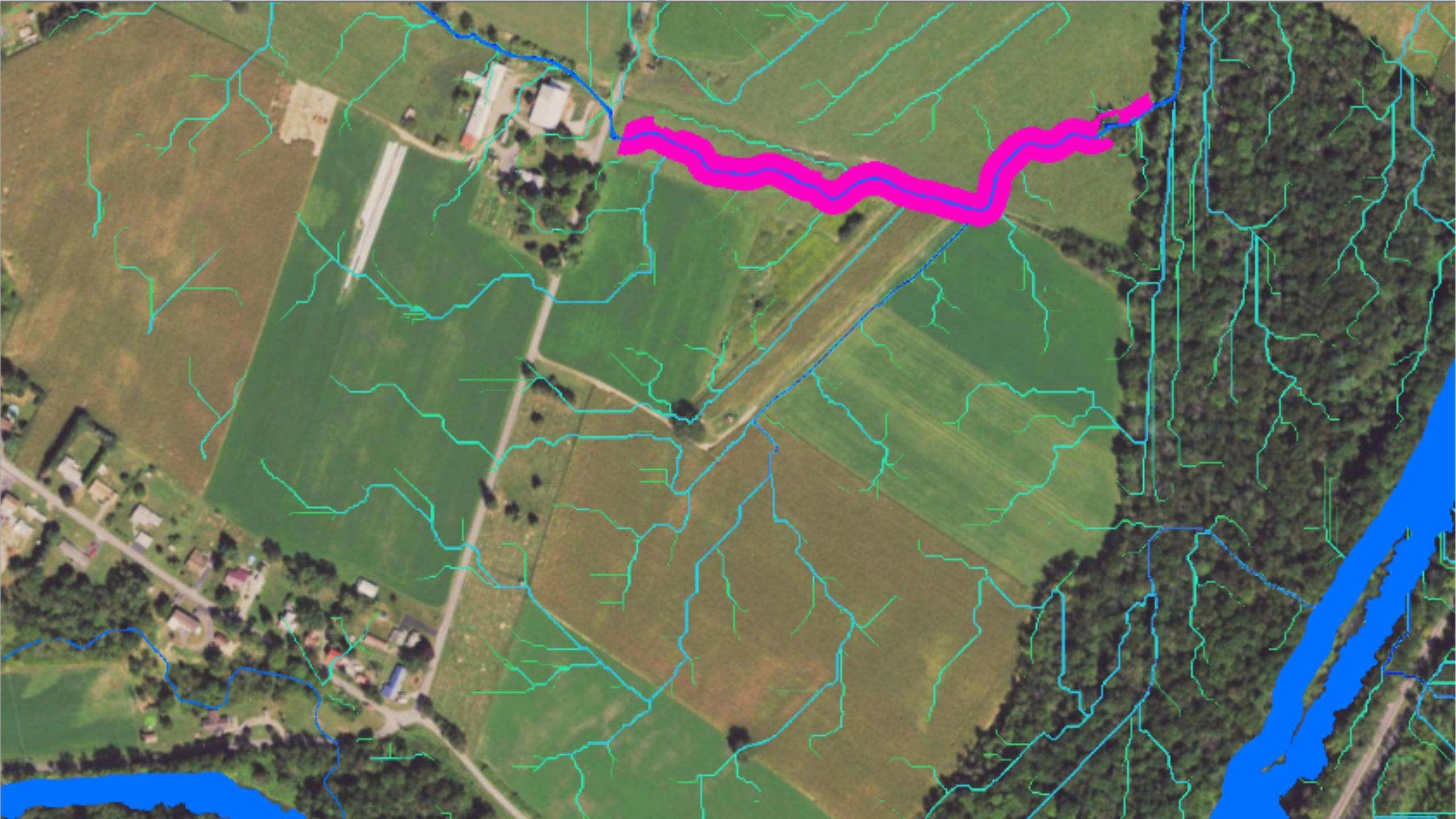
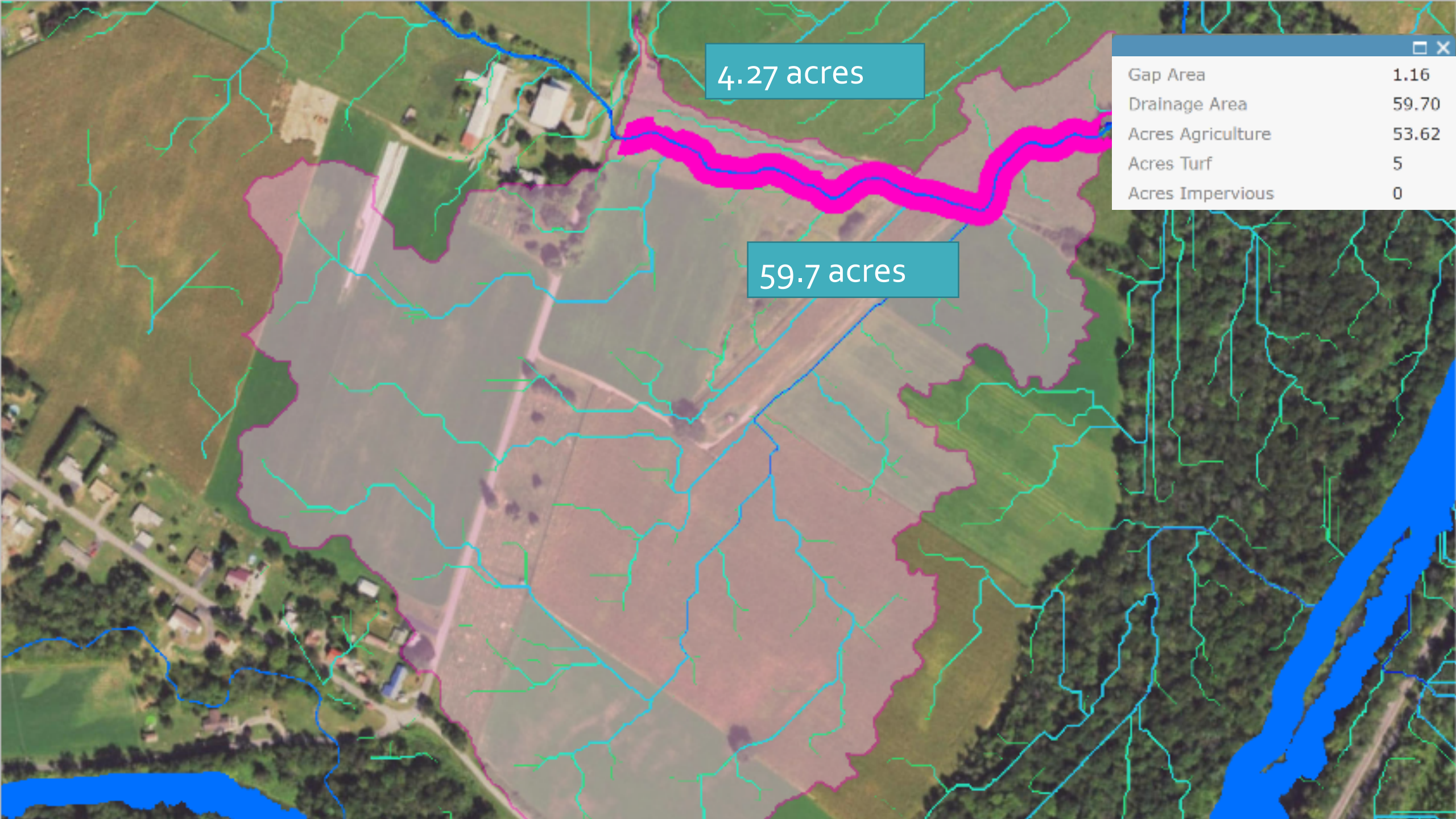
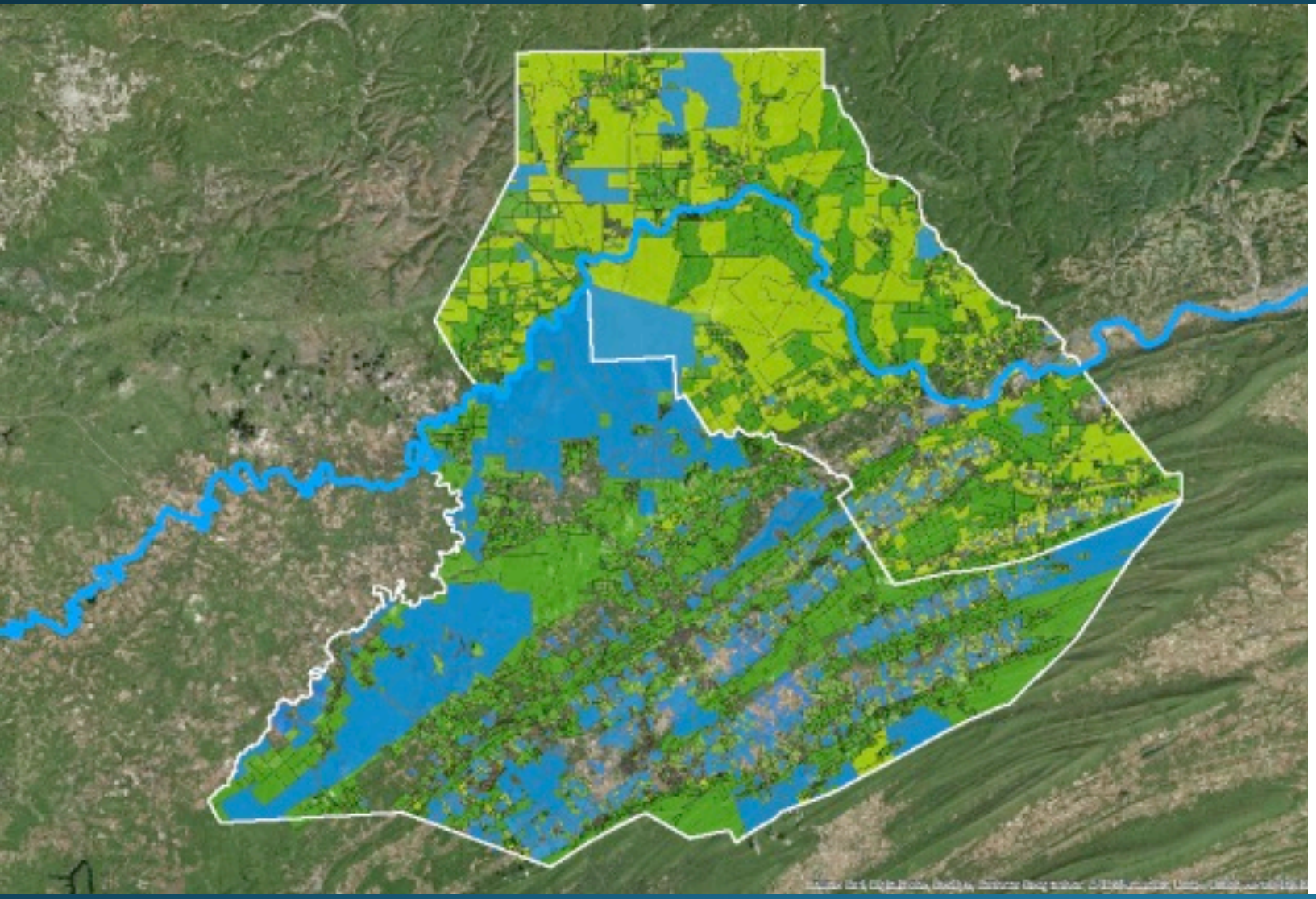
Low Vegetation
Shrubland
Structures
Tree Canopy
Tree Canopy over Impervious Roads
Tree Canopy over Impervious Surfaces
Tree Canopy over Structures
Water
Wetlands
Pixel size: 1 meter by 1 meter
Identified gaps in riparian forest buffer coverage

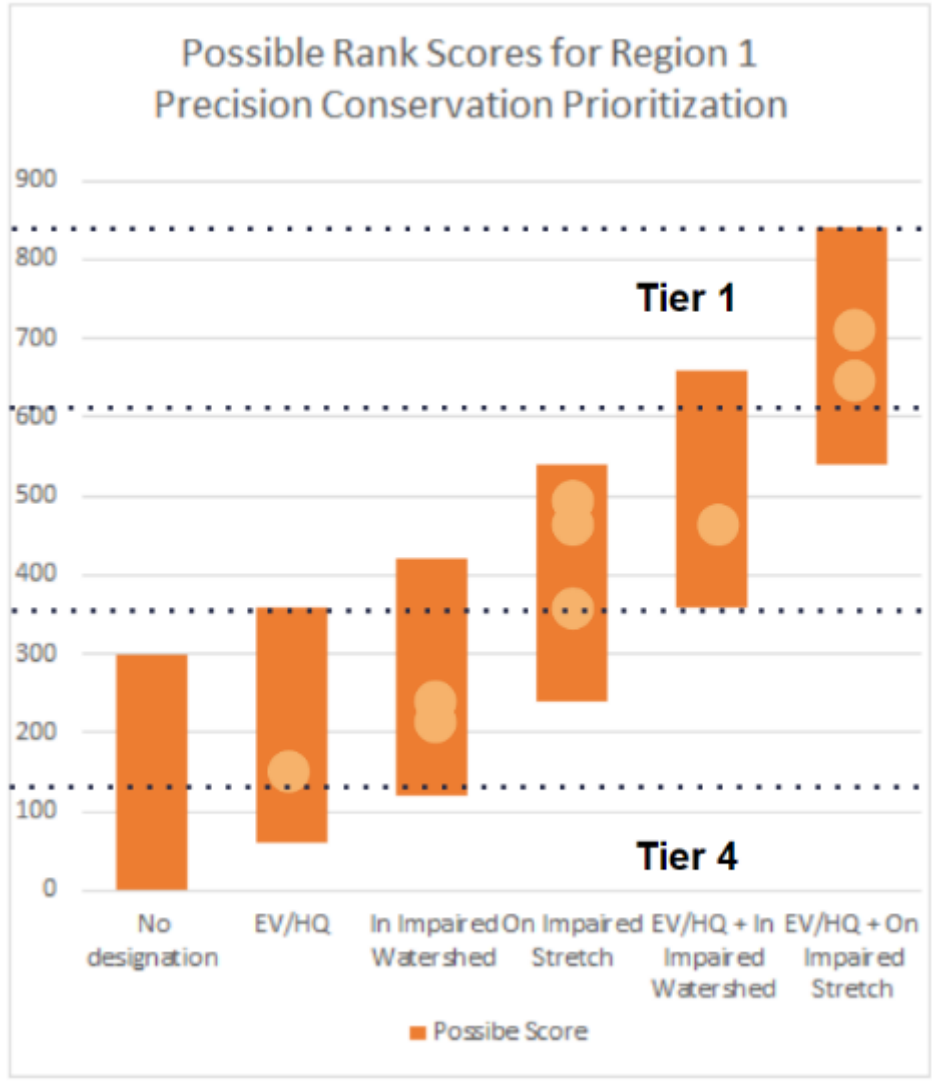
1.18 acres
1.16 acres
Compare restoration opportunity areas



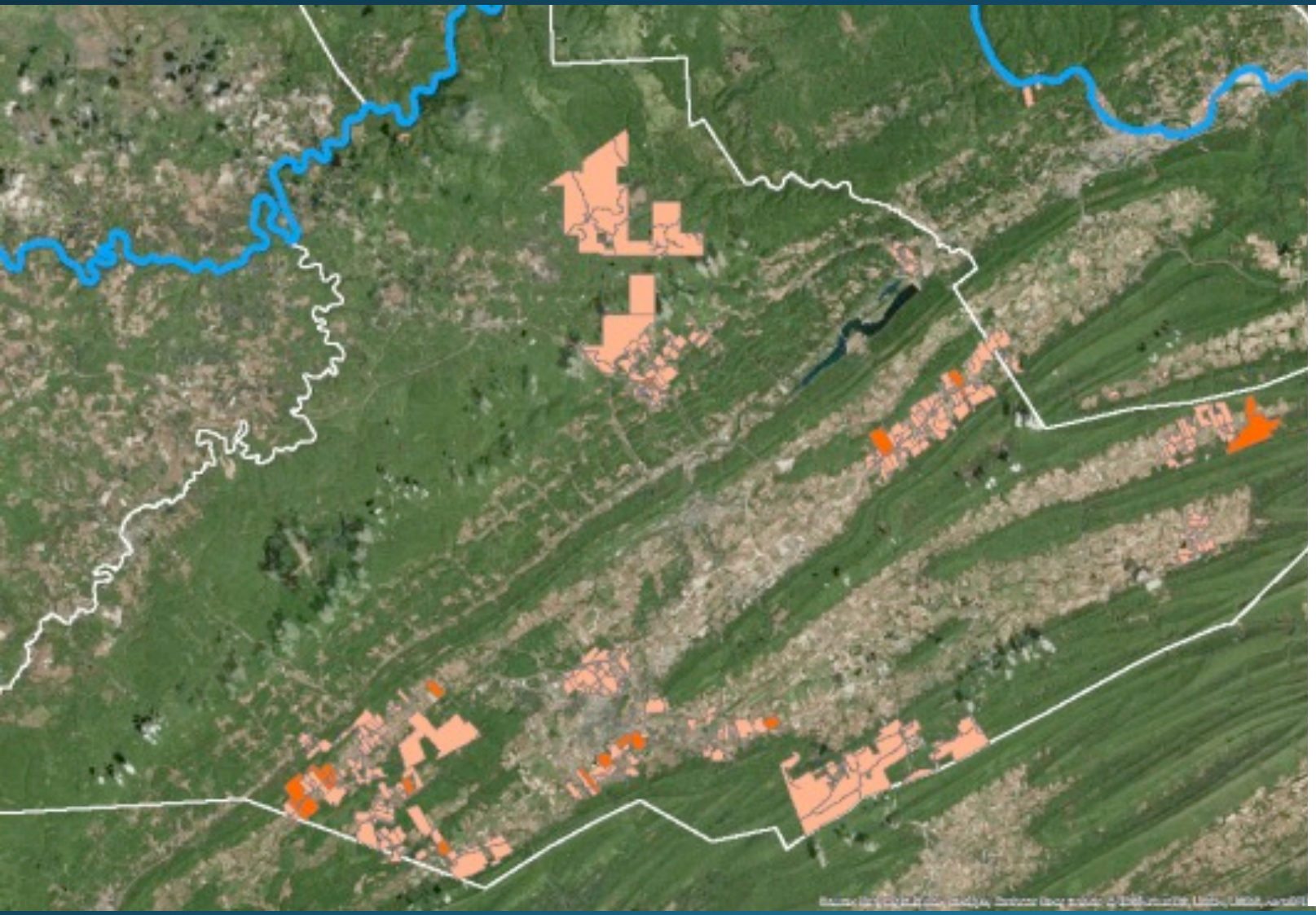

4.27 acres
59.7 acres
Gap Area 1.16
Drainage Area 59.70
Acres Agriculture 53.62
Acres Turf 5
Acres Impervious 0

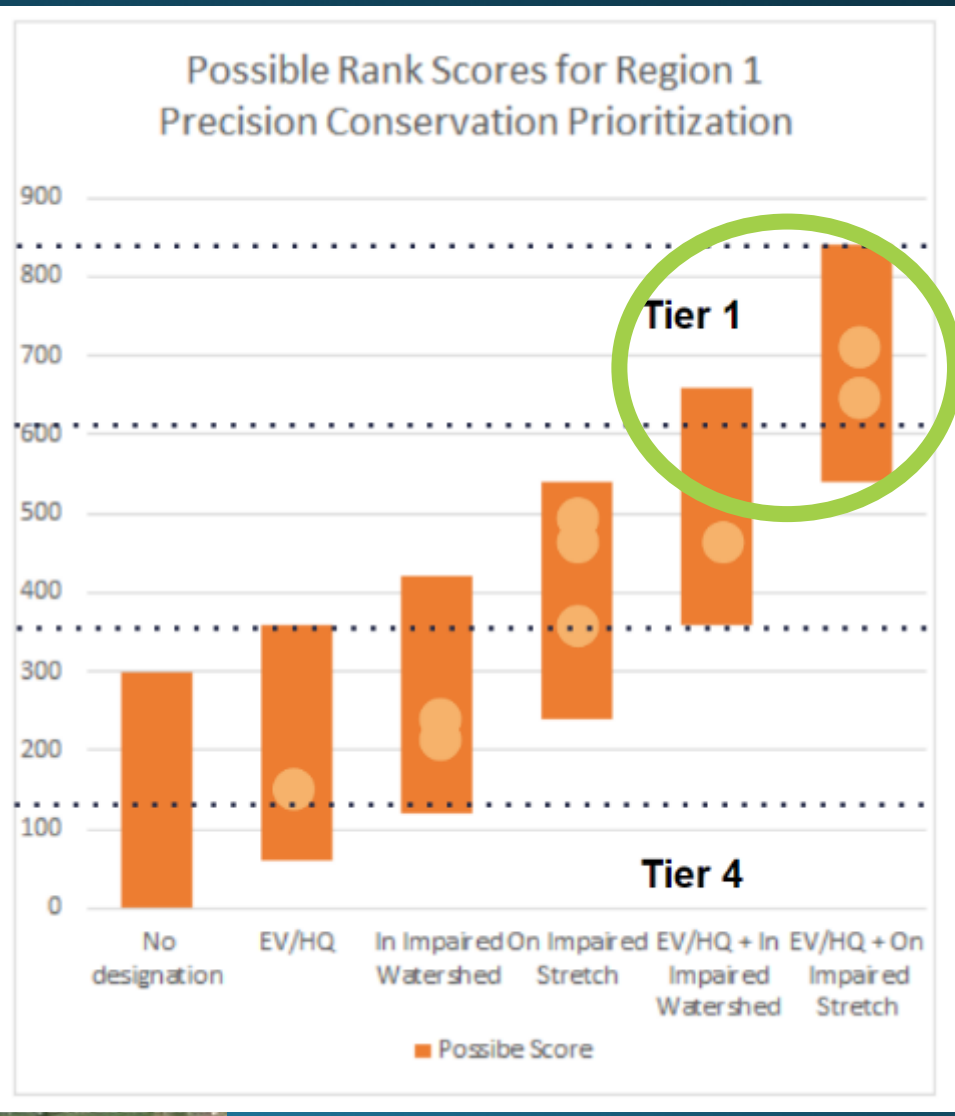
Assessing the landscape





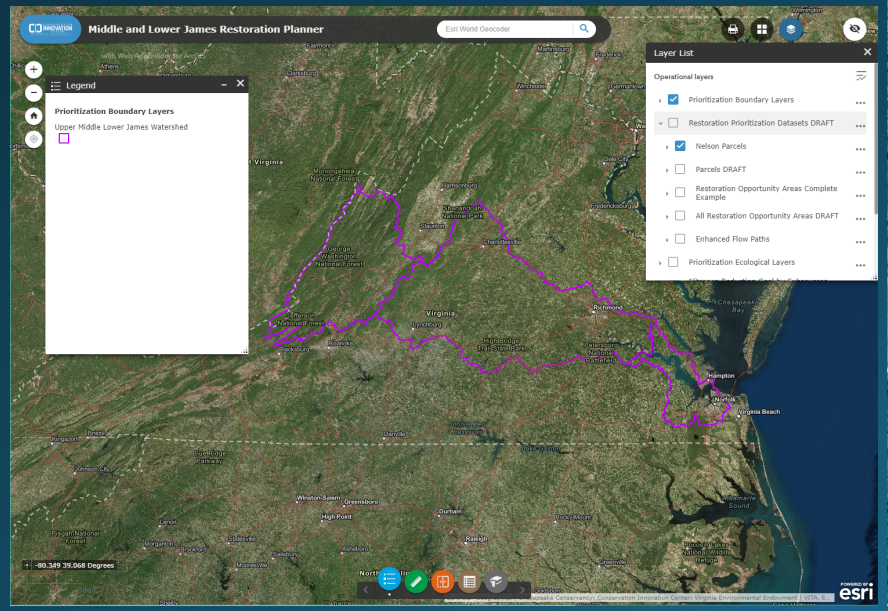
Aligning for High-Impact Restoration

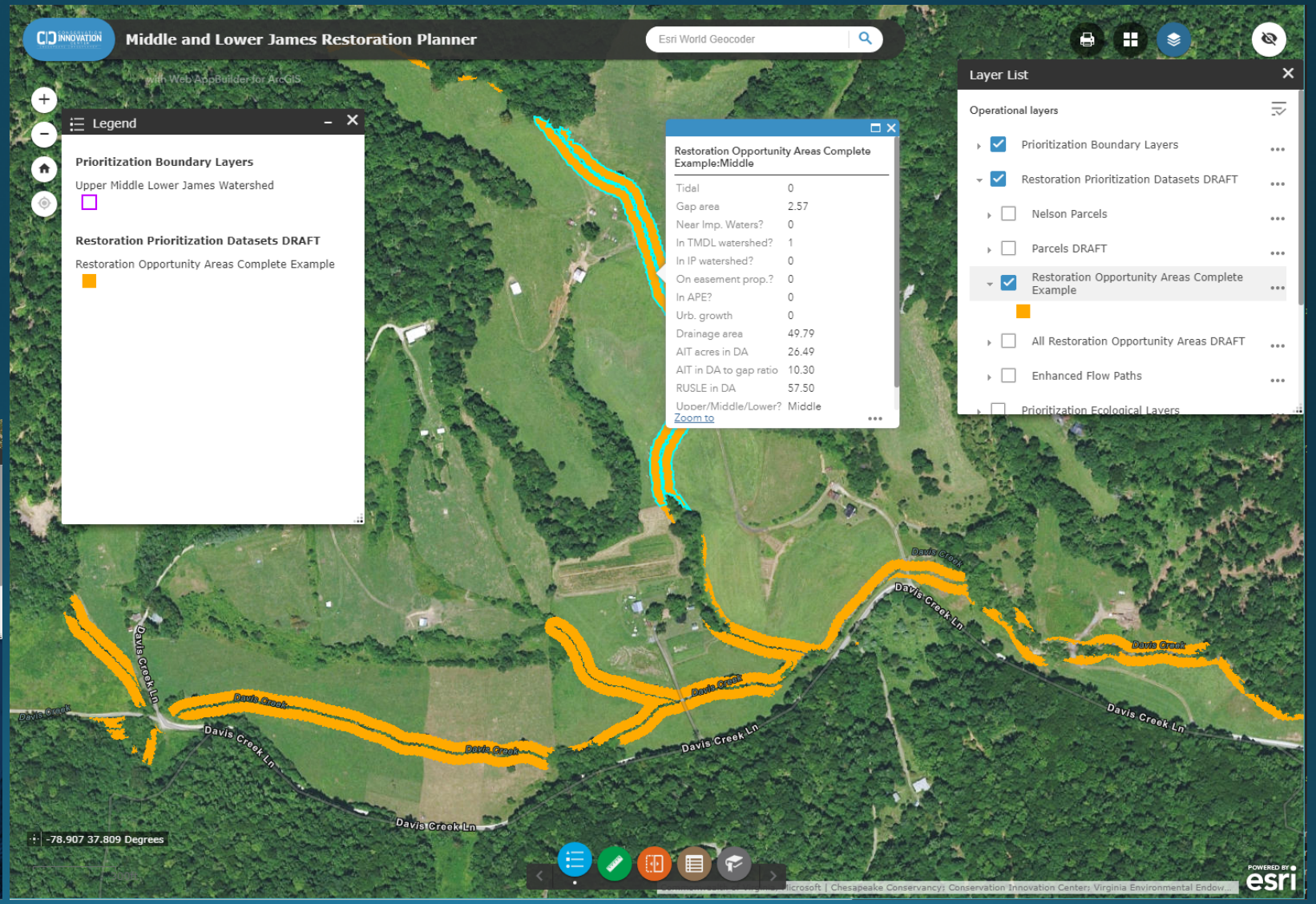




Making Data Accessible

- View prioritized restoration opportunity areas
- Interactive tool for applicants and funders



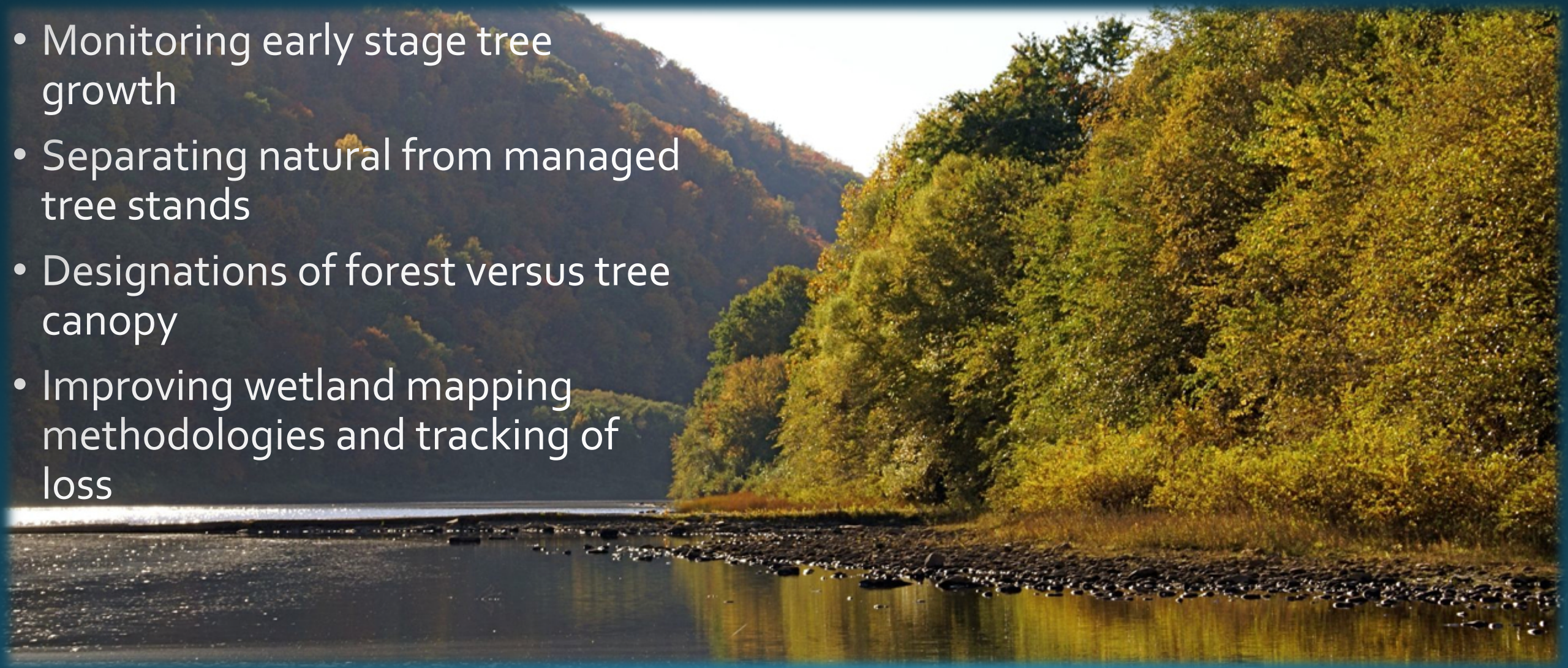


More Information

- Conservation Innovation Center
  conservationinnovationcenter.org
- Chesapeake Bay Land Cover
  conservationinnovationcenter.org/land-cover-data-project
- Pennsylvania Case Study – Conservation Opportunities Analysis
  envisionthesusquehanna.org/precision-conservation-data-and-tools
- Pennsylvania Case Study – Restoration Reporting
  restorationreports.com
- Maryland Case Study – Watershed Delineation Tools
  chesapeakeconservancy.org/apps/ConservationToolbox
  Watershed Delineation -> "Zoom to Chester"
- Maryland Case Study – Prince George's County Stormwater Prioritization Tool
  chesapeakeconservancy.org/apps/PG_Stormwater

Carbon Monitoring Needs

- Monitoring early stage tree growth
- Separating natural from managed tree stands
- Designations of forest versus tree canopy
- Improving wetland mapping methodologies and tracking of loss



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